Brief review of mAb structure

There are several reviews on mAb structure (Davies & Metzger, 1983; Presta, 2003; Wang, Singh, Zeng, King, & Nema, 2007), and here we briefly summarize the main structural components. mAbs are highly complex macromolecules where the monomeric unit has a molecular mass of 150–180 kDa and an overall Y shape (Figure 1.2(a)). The secondary and tertiary structural features of antibodies have been reviewed (Janeway, Travers, Walport, & Shlomchik, 2001; Woof & Burton, 2004). Essentially, the polypeptide chains form antiparallel β sheets which comprise ~70% of the secondary structure as shown by Fourier Transform Infrared Spectroscopy (FTIR) and Circular Dichroism (CD) analysis (Cathou, Kulczycki, Jr. Haber, 1968; Chen et al., 2003). These β sheets are organized into

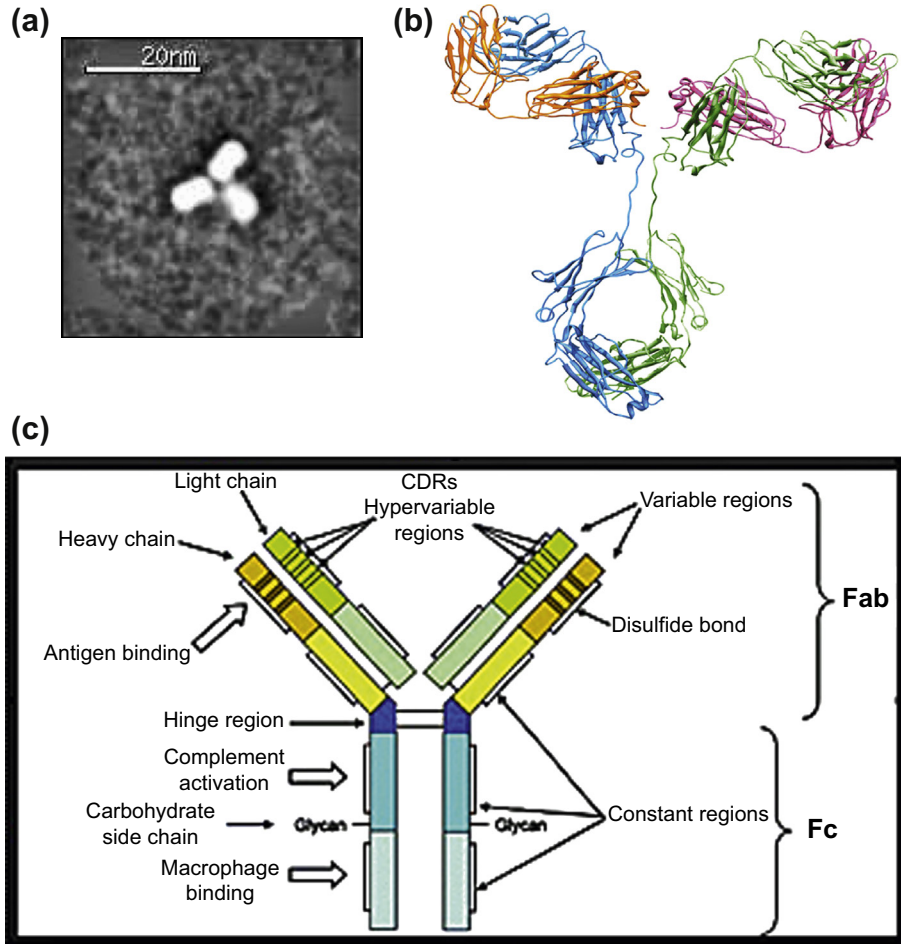

Figure 1.2 (a) Electron microscope photo of an IgG1 mAb. (b) Ribbon diagram of an antibody showing main, secondary, and tertiary structural folding (directional arrows are β sheet structures). (c) Schematic of an IgG mAb showing key structural features.